

REMARKS

This amendment is filed in response to the Office action mailed Sept. 24, 2002, in which claims 1-10 are rejected. With this amendment, claims 1 and 4 are amended, and the claims are otherwise the same, so that claims 1-7 remain in the application.

Attached hereto is a marked-up version of the changes made to the application by this amendment. The attachment is captioned "Version with marking to show changes made."

Also filed with this paper is a proposed drawing change correcting a typographical error in Fig. 3.

Mistake in attorney docket number

The Office action indicates "SAA-(122.161" as the attorney docket number, which is incorrect and not the docket number provided with the application transmittal. Applicant requests that the record be corrected in respect to the attorney docket number. The docket number should be either "SAA-25(122.161)" as shown in the transmittal for the application, or simply "SAA-25".

Rejections under 35 USC §112, first paragraph

At paragraph 3 of the Office action, claim 1 is rejected under 35 USC 112, first paragraph, in respect to a clause that recites specializing a general purpose query protocol. Applicant respectfully submits that the specializing of a general purpose query protocol is a necessary consequence of the step recited in claim 1, and is not itself a step to be performed, as applicant intended to make clear by introducing the subject clause using the "thereby" as opposed to e.g. "wherein" or some other terminology that would be construed as introducing a further claim element or limitation. (Applicant relies on *Landis on Mechanics of Patent Claim Drafting*, by Robert C. Faber, fourth edition, section 32, for authority that a "whereby" or a

"thereby" clause "is proper when it merely describes a function, operation, or result that necessarily follows from the preciously recited structure or method.") In other words, the invention as claimed in claim 1 is to make a permanent-type connection to a network I/O device for a control element or for a monitoring element based on an analysis of communication transactions between a controller and the control element or the monitoring element where the controller communicates with the network I/O device according to a general purpose query protocol. The claim then recites, *for purposes of explanation or summing up only*, that the step of making a permanent-type connection specializes (or in effect, specializes) the general purpose query protocol.

Further, applicant's attorney includes with this response an affidavit under 37 CFR 1.132 by an expert in the subject art (computer-to-computer communications in industrial control) stating that the anyone skilled in the art would understand from the specification how to practice the invention as claimed in claim 1, and that the necessary result of performing the step of making permanent-type connections recited in claim 1 is to specialize the general purpose query protocol used by the controller for communicating with the network I/O devices.

Accordingly, applicant respectfully requests that the rejection of claim 1 under 35 USC 112, first paragraph, be withdrawn.

Rejections under 35 USC §112, second paragraph

At paragraph 5 of the Office action, claims 1-7 are rejected under 35 USC 112, second paragraph, for indefiniteness. With this amendment, claims 1, 2 and 4 are changed in a way believed to obviate the grounds for the rejections under 35 USC 112, second paragraph.

Accordingly, applicant respectfully requests that the

rejections under 35 USC §112, second paragraph, of claims 1-7 be withdrawn.

Rejections under 35 USC §103

At paragraph 7 of the Office action, claims 1-7 are rejected under 35 USC 103, as unpatentable over U.S. Pat. No. 6,327,511 to Naismith et al.

Naismith et al is not a reference under 35 USC §103

Although the Office action does not assert a ground under 35 USC 102 for the rejection under 35 USC 103, the ground is assumedly 345 USC 102(e), although possibly instead either 35 USC §102(f) or (g). Regardless, Naismith et al is not a reference for purposes of 35 USC 103 under 35 USC §102(e) or under 35 USC §102(f) or (g), since 35 USC §103 provides that, "Subject matter developed by another person, which qualifies as prior art only under one or more of subsections (e), (f), and (g) of section 102 of this title, shall not preclude patentability under this section where the subject matter and the claimed invention were, at the time the invention was made, owned by the same person or subject to an obligation of assignment to the same person." Based on applicant's attorney's review of the assignment (by both inventors) recorded for the present application (indicating an obligation to assign per an employee agreement, and recorded on Dec. 7, 1999) and as confirmed by Richard A. Baker, Jr., Director of Automation Intellectual Property for Schneider Automation Inc., the present application and Naismith et al were, at the time the invention of the present application was made, owned by the same company, namely Schneider Automation Inc. of North Andover, Massachusetts, or subject to an obligation of assignment to the same company.

CONCLUSION

For all the foregoing reasons it is believed that claims 1-7 are in condition for allowance and their passage to issue is earnestly solicited.

Respectfully submitted,

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Date



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Version With Marking To Show Changes Made

In the disclosure:

The paragraph beginning at page 12, line 22 is changed as follows:

--Still referring to Fig. 4, another step of the method of the present invention is to arrange (by suitable pre-programming) for the PLC to automatically use a permanent-type TCP connection to a control or monitoring element, based on an ~~analysis~~ analysis of the communications with the control or monitoring element, such as, e.g. whether the device is queried frequently enough to warrant maintaining the connection as a permanent-type connection. A permanent-type TCP connection is simply a TCP connection, between two network I/O devices, that is not closed, at least not immediately, after it is first opened and transactions or data at hand are transmitted from one of the devices to the other. Instead, the connection is left open for later use in communicating between the two devices additional transactions or data.--

In the claims:

The claims below are changed as follows.

1. (Amended) A method for adapting a general purpose query protocol for use by an industrial control system, the industrial control system including a controller for providing control, ~~via a network for communication according to a model compatible with the Open Systems Interconnection (OSI) seven layer model,~~ over an industrial process through at least one control element and at least one monitoring element, each coupled to the network via a

network I/O device, the controller for providing control via a communication network according to an Open Systems Interconnection (OSI) type of network communication model including a transport layer, and in providing such control the controller communicates~~for performing communication~~ with the network I/O devices according to the general purpose query protocol, the method comprising the step of:

a) making a permanent-type connection to the network I/O device for the control element or for the monitoring element based on an analysis of communication transactions between the controller and the control element or the monitoring element;

thereby specializing the general purpose query protocol, which would ordinarily be used in computer-to-computer communications for making ad hoc queries of an external device, to use by the industrial control system in performing frequent communication of control and monitoring information between the controller and the control element or the monitoring element of the industrial control system.

4. (Amended) The method as claimed in claim 3, wherein the protocol is ~~compatible with the~~ an open MODBUS/TCP type of protocol.

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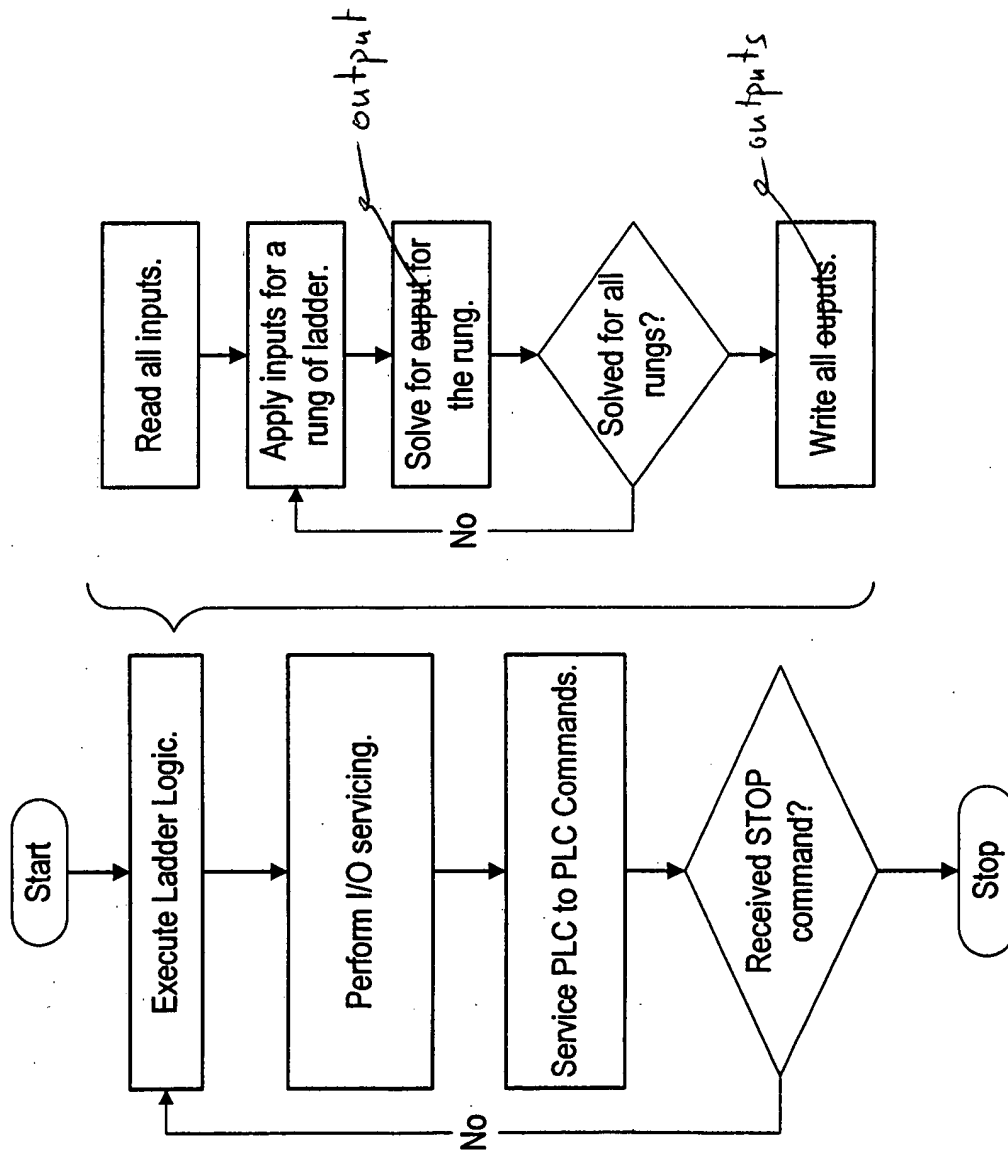


Fig. 3

Allow tuning of how long to wait for response to a query from a control or monitoring element, based on how long the element typically takes to respond.
Allow tuning of how often to query a control or monitoring element, based on the importance of having recent status information from the element.
Use a permanent-type network connection to a network I/O device for a control or monitoring element if the element is queried frequently enough.
Allow selecting of either of three Modbus protocols for a communication transaction: read register, write to register, or read and write to register of a network I/O device for a control or monitoring element.

Fig. 4